

# Agilent R8111 Reference Electrode
# 参比电极

## Operating Guide
## 用户手册

Agilent Technologies

# Overview

The R8111 Electrode is a silver-silver chloride reference electrode for use in the laboratory. It should be used with a 3200P pH meter, a 3200I Ion meter, or similar meters.

WARNING **Use this electrode according to the operating manual to avoid personal injury.**

WARNING **The electrode solution can cause chemical burns or illness if it is taken orally or contacted by human skin. Use protective clothing or gloves to avoid contact. In case of contact, rinse contacted area with tap water or deionized water thoroughly.**

CAUTION The electrode body material is glass. Handle with care to avoid damage to the instrument.

**Table 1** R8111 Reference Electrode specifications

| Specification | Value |
|---|---|
| Temperature range | 0 to 70 °C |
| Reference type | Ag/AgCl |
| Liquid junction material | Ceramics |
| Reference filling solution | 3 mol/L KCl containg AgCl |
| Cable interface | DC-401 |
| Electrode diameter | 12 mm |
| Electrode length | 120 mm |
| Cable length | 1000 mm |

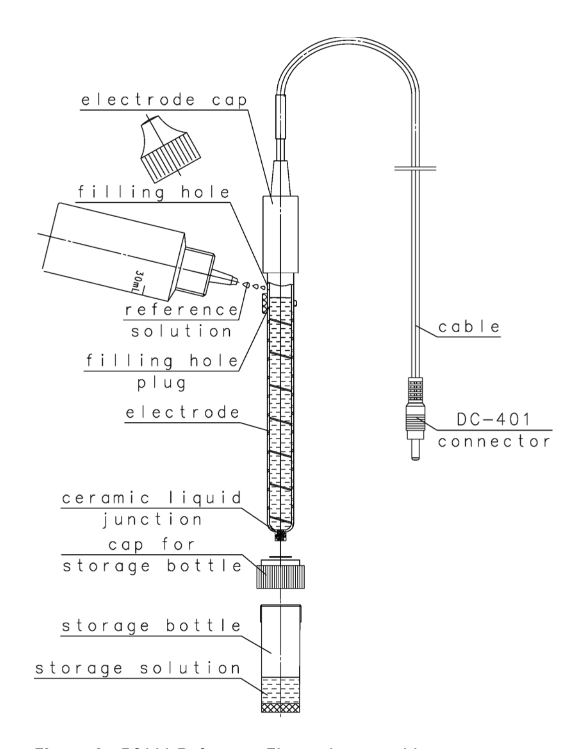



**Figure 1** R8111 Reference Electrode assembly

# Operation

## Preparation

1 Remove the storage bottle from the electrode. Store the bottle and cap upright for future use.
2 Rinse the measuring tip with distilled or deionized water.
3 Hold the electrode with the measuring tip downwards and swing it several times.
4 Unplug the filling hole.

## Measurement

1 Connect the electrode to the meter. Enter the temperature of the calibration solution according to the meter operating manual.
2 Soak the measuring tip in calibration solutions in sequence. Calibrate the electrode according to the meter operating manual.
3 After calibration, soak the measuring tip in sample solution. When the reading becomes stable, read the value from the meter.

## Operating hints

- The main materials of the electrode measuring tip are glass and ceramic frit. Ensure the sample solution will not damage the measuring tip before measurement.
- During measurement, the level of reference filling solution (p/n 5190-0545) in the electrode should be above the level of the sample solution.
- Small white crystals or powder that forms on the electrode during measurement or transportation is harmless and does not affect the performance of the electrode. Rinse the reside from the electrode with tap or deionized water.
- Do not apply force onto the electrode cap, cable, or cable interface.
- Keep the cable interface dry.

# Maintenance

## Exchange of the reference filling solution

1 Siphon the electrode reference filling solution and add fresh reference filling solution (p/n 5190-0545) until the level is 5 mm below the filling hole.
2 Repeat several times.

## Cleaning of inorganics

Soak the measuring tip in 0.1 mol/L HCl or EDTA solution for 15 minutes.

## Cleaning of organics

Soak the measuring tip in absolute ethyl alcohol or other solvent that can dissolve organics for 15 minutes.

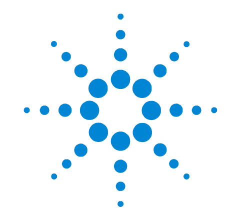
## Cleaning of protein precipitation

1 Soak the measuring tip in 0.1 mol/L HCl solution that contains 1% pepsin for 15 minutes.
2 Exchange the reference filling solution and soak the measuring tip in reference filling solution for 2 hours.

For any other problems during electrode use, contact your Agilent Technologies customer service representative.

# Storage

1 Rinse the measuring tip.
2 Plug the filling hole and install the electrode storage bottle and cap onto the electrode body in sequence. To protect the measuring tip, keep 5–10 mm between the bottom of storage bottle and the electrode measuring tip.
3 Screw the storage bottle cap of the electrode until finger tight.
4 Place the bottled electrode in the storage box and store at ambient temperature in a dry location.



# Agilent R8111
# 参比电极

## 用户手册

Agilent Technologies

# 概述

实验室用银 - 氯化银参比电极，与 3200P 或 3200I 或类似仪器配套使用。

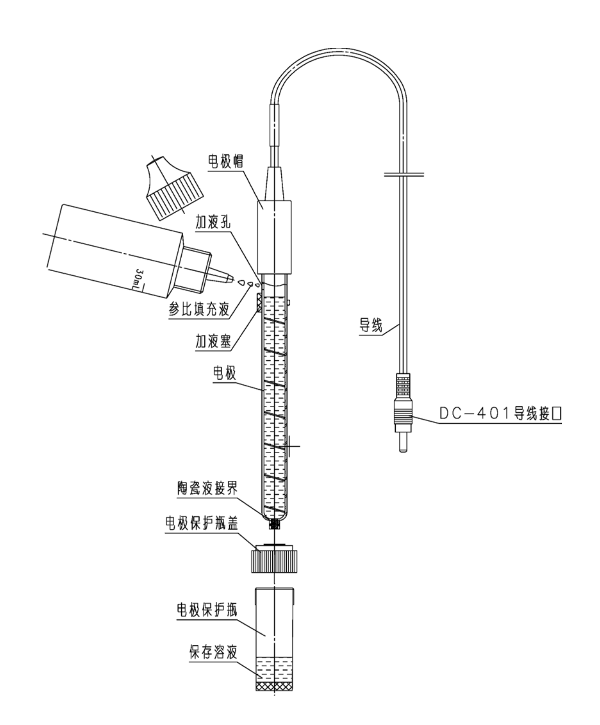
# 安全提示

1 按使用说明使用本电极。
2 电极附带的参比填充液不宜口服或接触人体敏感器官，如意外接触，应立即用自来水或去离子水清洗。
3 电极主体材料为玻璃，在没有成年人监管时，不要让十八岁以下人接触或使用本电极。
4 在储运或使用过程中，电极上可能有少量白色粉末或晶体附着，这是由部分渗出的参比填充液或保存溶液失去水分引起，可用自来水或去离子水冲洗去除，不影响电极的性能。

# 技术参数

| | |
|---|---|
| 适用温度范围 | 0-70 °C |
| 参比系统 | Ag/AgCl |
| 液接界材料 | 陶瓷 |
| 参比填充液 | 含 AgCl， 3 mol/L KCl |
| 导线接口 | DC-401 |
| 电极直径 | 12 mm |
| 电极长度 | 120 mm |
| 导线长度 | 1000 mm |

# 电极插图




# 使用步骤

## 电极准备

1 旋开电极保护瓶盖，依次取下电极保护瓶、电极保护瓶盖，将电极保护瓶开口向上水平放置待用。

2 用蒸馏水或去离子水冲洗电极测量端，将电极测量端向下，空甩电极数次。

3 打开加液塞。

## 电极测量

1 将电极与仪器连接。
2 将电极与配套使用电极的测量端浸没于被测溶液中。
3 待仪器读数稳定后，读取读数。
4 测量完毕，堵住加液孔 , 冲洗电极测量端，依次将电极保护瓶盖、电极保护瓶安装在电极外壳上，， 安装时应使电极与电极保护瓶的底部保持 5-10mm 距离以免造成电极损坏 , 并旋紧电极保护瓶盖。

# 储存方法

将电极放回电极包装盒内，室温干燥保存。

# 注意事项

- 电极测量端的主要材料为玻璃和陶瓷砂芯，测量前应确认被测溶液不会对电极测量端造成损伤。
- 测量时，电极的参比填充液 (p/n 5190-0545) 高度应高于被测水样。
- 电极帽、导线以及导线接口部分应避免受力，以免损坏。
- 导线接口必须保持干燥。

# 电极维护

### 更换参比填充液

1 将电极的参比填充液吸空 , 从加液孔注入新鲜的参比填充液 (p/n 5190-0545) 至距离加液孔 5 mm 左右处。
2 再次吸空参比填充液，从加液孔注入新鲜的参比填充液至距离加液孔 5 mm 左右处。

## 电极清洗和修复

1 对电极测量端附着的无机物沉淀，可将电极测量端浸没于 0.1 mol/L 稀盐酸或 0.1 mol/L EDTA 中 15 min。
2 对电极测量端附着的有机物，可将电极测量端浸没于无水乙醇 （或能够溶解该有机物的溶剂）中 15 min。
3 对电极测量端附着的蛋白质沉淀，可将电极测量端浸没于 1 % 胃蛋白酶和 0.1 mol/L 盐酸的混合液中 15 min。

**电极清洗完毕，应更换参比填充液，并将电极测量端浸没于参比填充液内 2h。**

**如在电极使用过程中有其他疑问，请联系售后服务部门。**

**如需购买，请与安捷伦经销商联系或者登陆安捷伦官方网站。**

**www.agilent.com**



Printed in China 03/2012
First edition, March 2012



5973-1794

